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Landslide dams in Cordillera Blanca (Peru)

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Landslide dams are less common as “conventional” landslides, but in high mountain region they can be rather frequent and potentially more dangerous for inhabitant’s safety. Landslides dams failure are destructive event that led catastrophic consequences on lives and properties in downstream areas. Landslide and moraine dams and their lakes are relatively common in the Cordillera Blanca of Peru and they have produced urge damages and fatalities several times. Catastrophic debris flows and floods are direct consequence of a dam failure and they are potential major hazards in the region.
Climatic changes is visibly modifying the environment in this region (glacial retreat, formation and evolution of moraine dammed lakes, slope instability) and rivers’ and dams’ equilibrium is continually disturbed and altered. The entire process (i.e. formation and potential dam collapse) need appropriate scientific attention, since the assessment of landslides dams formation and evolution is a complex task. The studies of past landslide dam cases are essential in forecasting induced risks, and specific works on this topic are not sufficiently widespread.
The main objective of this study is to provide an inventory of landslide and moraine dams in the Cordillera Blanca (Peru), and an outline their characteristics in order to analyze present and future landslide dam evolution. Existing, failed and infilled landslide dams are present in the area of interest. The main morphometric parameters and information of the landslide, the dam body, the valley, and the lake, if any, have been determined. A low variability in some of the main morphometric parameter distributions (landslide volume and valley width) has been displayed, due to the regional tectonic and glacial history which conditioned the environmental evolution. The Peruvian inventory have been compared with an Italian landslide dams database, analyzing both differences and similarities of the two inventories.